A Study on Asymmetric Cost Behavior among selected ASEAN-5 Banks: Insights for the New Normal

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Abstract: Despite cost asymmetry being proven in different industries and across various countries, studies on cost asymmetry have generally excluded financial institutions due to the differences in business model and heavier regulations. Our study confirmed that banks based in ASEAN-5 countries exhibit asymmetric cost behavior. In addition, the high credit risk has a significant effect on stickiness among banks. Finally, insights on the implications of the results were drawn in the advent of the ASEAN integration and the uncertainties in the new normal.

Key Words: asymmetric cost behavior; banks; cost stickiness; managerial decisions; ASEAN banks

1. INTRODUCTION

The Covid-19 pandemic has redefined the business landscape around the world. No business was spared as lockdowns were imposed and economic activities ground to a halt. In coping with the effects of the pandemic, and to thrive in the new normal, banks have redefined their conventional business models by adapting new platforms, ecosystems, payments mechanisms, and data for the future to remain resilient (Watson & Critchley, 2022). But to remain competitive in this new business environment, banks are also rethinking their business models, some are even considering resorting to taking excessive risks to improve returns (Berger, Klapper, & Turk-Ariss, 2017).

One of the practical ways to competitiveness amidst these pressures and heavier regulations is for these banks to have efficient cost management (Fethi and Pasiouras, 2009). Typically, banks deal with four micro foundations in their cost structure, namely: payroll, infrastructure, marketing, and office and equipment costs. Hanafizadeh and Marjaie (2021) emphasized that banks need to analyze the cost of each micro foundation to have a feasible business model. This becomes more important when banks deviate from conventional banking towards a more innovative and technology-driven business model or when banks encounter unforeseen disruptions in operations such as a pandemic. Thus, a comprehensive understanding of cost behavior is vital in achieving efficient cost management.

The common assumption is that costs behave in proportion to changes in activity level (Noreen, 1991, Koyama et al., 2016). However, recent studies have proven that costs behave disproportionately to activity level changes. This is referred to as asymmetric cost behavior, which can either be cost sticky or anti-sticky (Banker & Byzalov, 2014). Studies in asymmetric cost behavior use sales, general, and administrative expenses (SG&A) which are generally referred to as discretionary costs. However, these studies exclude banks or other financial services given their unique business model.

1.1 Problem Statement

To address this gap, our study assesses the degree and determinants of asymmetric cost behavior in banks in the ASEAN-5. Specifically, we evaluated the effects of prior period changes in activity level and credit risk on cost asymmetry of ASEAN-5 banks.

1.2 Literature Review
1.2.1 Cost stickiness

Noreen and Soderstrom (1997) tested the traditional model of cost behavior, discovering that there is a disproportionate movement of costs in response to activity level. Anderson, Banker, and Janakiraman (2003; hereinafter, ABJ) then provided stronger evidence of cost asymmetry and presented the concept of cost stickiness, finding that sales, general, and administrative expenses (SG&A) decrease less proportionately to a decline in sales, as compared to how these expenses increase when sales increase. ABJ were the first to coin this phenomenon as "cost stickiness" since these costs still "stick" despite decreasing activity level. Furthermore, they argued that this sticky behavior is due to deliberate managerial decisions to retain slack resources despite the sales decline because management generally chooses to retain slack resources rather than incur adjustment costs. However, when demand increases, managers can fully meet the demand only if they add the required resources.

The study of Corporate and Werbin (2012) is one of the limited researches done on assessing the presence of cost stickiness among banks. They ran separate tests on the banking industries of Argentina, Brazil, and Canada, which showed that banking industries in these countries are cost sticky in the short term due to the tendency of managers to delay cutting costs. This is because managers hesitate after considering the trade-off between the cost of having slack resources and the cost of exit and replacement of resource disposal.

1.2.2 Cost anti-stickiness

Cost anti-stickiness is a cost behavior wherein the discretionary costs decrease more in response to a decline in activity level than they increase in response to an increase in activity level (Weiss, 2010; Banker & Byzalov, 2014; Sugiri et al., 2016). Cost anti-stickiness is commonly attributed to economic downturns, pessimistic managerial decisions, and managerial incentives. Banker, Fang & Mehta (2013) and Trinh (2018) both concluded that entities experiencing an abrupt sales decline in times of crises exhibit greater cost anti-stickiness, due to the pessimistic perspective of managerial decisions during economic crises. Furthermore, Sugiri et al.'s (2016) research on the behavior of executive compensation costs in Southeast Asian banks showed that Malaysian and Indonesian banks exhibited anti-sticky behavior, because incentives for managers to meet target earnings push management personnel to respond immediately to a decline in sales.

1.2.3 Determinants of asymmetric cost behavior

Prior period changes in activity level

Previous studies (e.g., Banker and Byzalov, 2014 and Koyama et al., 2016) have proven that prior period changes in activity level can influence a manager's decision on whether to retain or remove slack resources. This implies that managers generally become more optimistic and retain slack resources whenever there is an increase in the prior period activity level, whereas they become pessimistic and remove resources whenever there is a decrease in prior period activity level. The influence of prior period activity levels on managerial decisions is also explained by the economic theory of sticky costs (Banker, Fang & Mehta, 2013), as managers would be reluctant to reduce resources when there are relatively high adjustment costs involved.

Credit Risk

Salamah and Abulezz (2017) conducted a study on the cost behavior of Egyptian firms, excluding banks and financial services sector. They found that risk-taking firms respond to sales decline by retaining resources which leads to cost stickiness, while risk-averse firms respond to sales decline by quickly cutting resources so as not to bear retention costs, resulting to anti-sticky behavior. This conclusion is also supported by the study of Kama and Weiss (2012) on abrupt resource adjustment and cost anti-stickiness.

Ownership structure

Ownership structure may also affect the degree of cost asymmetry because of agency probalems which occur when there is a misalignment of interests between the shareholders and management. ABJ (2003) explained that agency costs can affect cost asymmetry to some extent since cost stickiness can also be caused by managers retaining resources for their own benefit. Chen, Lu, and Sougiannis (2012) found a positive association between cost asymmetry and managers' empire building incentives

due to agency problems. Other studies also support these conclusions (e.g., Randolph et al., 2017, and Jensen & Meckling, 1976).

1.2.4 Activity level in banks

Previous studies on cost asymmetry in banks used varying proxies for activity level (Porporato & Werbin, 2012; Sugiri et al., 2016). The proxy should be able to capture principal activities in commercial and universal banks. The monetary value of loan portfolios has been used as an activity measure for banks (Berger & Humphrey, 1997; Berger, Hancock & Humphrey, 1993; Guarda et al., 2012; Wilson & Wheelock, 2012). Since loan portfolios are considered as the principal source of activity for banks, our study used the average loans, claims and advances to customers as proxy for activity level.

1.3 Framework

1.3.1 Theoretical/Conceptual framework

Economic Theory of Sticky Costs. The basic premise of the economic theory of sticky costs is that many costs arise due to deliberate resource commitment decisions made by managers. Resource adjustment costs play a central role in this theory, generating cost sticky behavior that is inconsistent with the standard textbook model of fixed and variable costs (Banker, Fang & Mehta, 2013).

Deliberate Decision Theory applies when managers are faced with changes in activity level and they need to make appropriate decisions on whether to reduce resources when activity shrinks or to add resources when activity expands (Salamah and Abulezz, 2014). This implies that managers are intentional in their choice to adjust resource commitments when activity level fluctuates.

Agency Theory is the mismatch of interests between the management and the shareholders, which causes firms to incur agency costs. One type of agency problem that exhibits an impact on asymmetric cost behavior is empire building. It refers to the tendency of managers to grow the firm beyond its optimal size or to maintain unused resource to increase personal utility from status, power, compensation, and prestige (Hope & Thomas, 2008).

1.3.2 Operational framework

The empirical model for this study is an adoption of the log-log model derived by Uy (2011) from Cobb-Douglas production function as presented in Equation 1.

$$log(\frac{C_t}{C_{t-1}}) = \gamma_0 + \gamma_1 log(\frac{Y_t}{Y_{t-1}}) + \gamma_2 D_t(\frac{Y_t}{Y_{t-1}}) + \varepsilon_t \quad \text{(Eq.1)}$$

where: $D_t = 1$ if $\Delta Y_{i,t} < 0$ and $D_t = 0$ if $\Delta Y_{i,t} > 0$

Past studies on asymmetric cost behavior used the ABJ model (2003), wherein SG&A were measured against the changes in sales. The researchers modified the

ABJ model by using average loans as proxy for activity level to be applicable to this study on banks (Berger & Humphrey, 1997; Berger et al., 1993; Guarda et al., 2012; Wilson & Wheelock, 2012).

$$\log\left(\frac{XAGT_t}{XAGT_{t-1}}\right) = \beta_0 + \beta_1 \times \log\left(\frac{aveLCUACU_t}{aveLCUACU_{t-1}}\right)$$

$$+ \beta_2 \times D_t \times \log\left(\frac{aveLCUACU_t}{aveLCUACU_{t-1}}\right) + \varepsilon_t \quad \text{(Eq. 2)}$$

where:
$XAGT_t$ = administrative and general expenses in the current year
$aveLCUACU_t$ = average of total loans, claims and advances in the current year
$D_t=1$ if $\Delta\ aveLCUACU_t\ < 0$ and $D_t=0$ if $\Delta\ aveLCUACU_t > 0$

The coefficients β_1 and β_2 are used to determine the presence of cost asymmetry. If the value of β_2 is zero, then there is no evidence of cost asymmetry since the magnitudes of increase in administrative and general expenses and decrease are the same ($\beta_1 = \beta_1 + \beta_2$). On the other hand, if $\beta_2 < 0$, then the increase in administrative and general expenses for an increase in average loans, measured by β_1, is greater than decrease in expenses due to the decrease in average loans ($\beta_1 > \beta_1 + \beta_2$), signifying the presence of cost stickiness (Uy, 2016).

2. METHODOLOGY

2.1 Population

Our study included all publicly listed commercial and universal banks from ASEAN-5 countries: Indonesia, Malaysia, Philippines, Singapore, Thailand with available information in the Global Compustat database and used data within a 10-year period (2007-2017). Excluding banks which became publicly listed after 2007 and those with missing data, our study used a total of 80 banks based in ASEAN-5 countries.

2.2 Hypotheses and Model specification

Hypothesis 1 (H1) suggests that asymmetric cost behavior is present among commercial and universal banks in the ASEAN-5 with regards to changes in average loans to customers (Equation 2). We tested whether such behavior is cost sticky or anti-sticky. The ratio form and log specification allow the variables to be more comparable as well as decrease the likelihood of heteroskedasticity.

Hypothesis 2 (H2) proposes that changes in loans to customers during the prior period affect the degree of cost asymmetry in the current period (Equation 3). Banker and Byzalov (2014) state that when prior period activity level increases, the current discretionary costs would be sticky; on the other hand, when prior period activity level decreases, the current discretionary costs would be anti-sticky.

$$\log\left(\frac{XAGT_t}{XAGT_{t-1}}\right) = \beta_0 + \beta_1^I \times I_{t-1} \times \log\left(\frac{aveLCUACU_t}{aveLCUACU_{t-1}}\right) +$$

$$\beta_2^I \times I_{t-1} \times D_t \times \log\left(\frac{aveLCUACU_t}{aveLCUACU_{t-1}}\right) +$$

$$\beta_1^D \times D_{t-1} \times \log\left(\frac{aveLCUACU_t}{aveLCUACU_{t-1}}\right) +$$

$$\beta_2^D \times D_{t-1} \times D_t \times \log\left(\frac{aveLCUACU_t}{aveLCUACU_{t-1}}\right) + \varepsilon_t \quad \text{(Eq. 3)}$$

where:
I_{t-1} = Dummy variable equal to 1 if $LCUACU$ increased in prior period $t-1$, 0 otherwise
D_{t-1} = Dummy variable equal to 1 if $LCUACU$ decreased in prior period t-1, 0 otherwise
β_2^I = Degree of cost asymmetry in the current period, conditional on prior period increase in $LCUACU$
β_2^D = Degree of cost asymmetry in the current period, conditional on prior period decrease in $LCUACU$

Hypothesis 3 (H3) suggests that credit risk significantly affects the degree of cost asymmetry (Koyama et al., 2016). Equation 4 is an expanded log model adapted from Subramaniam and Watson (2016).

$$\log\left(\frac{XAGT_t}{XAGT_{t-1}}\right) = \beta_0 + \beta_1 \times \log\left(\frac{aveLCUACU_t}{aveLCUACU_{t-1}}\right) + \beta_2 \times D_t$$

$$\times \log\left(\frac{aveLCUACU_t}{aveLCUACU_{t-1}}\right) + \beta_3 \times D_t \times \log\left(\frac{aveLCUACU_t}{aveLCUACU_{t-1}}\right) \times LLP + \varepsilon_t$$

$$\text{(Eq. 4)}$$

where:
LLP = Provision for Credit Losses over Total Assets

2.3 Econometric model used

This study makes use of the Feasible Generalized Least Squares (FGLS) estimator of Linear Regression. The FGLS estimator is a weighted least squares (WLS) estimator that caters to serial correlation and heteroskedasticity (McFadden, 1999). In this case, FGLS estimator generally yields better and more precise estimates. FGLS enables the determination and examination of time-series effects on the dependent variable. Since the researchers' data consist of heavily regulated banks, using FGLS allows for more emphasis on time-series effects rather than firm-specific effects.

3. RESULTS AND DISCUSSION

3.1 Descriptive Statistics

Table 1 shows the descriptive statistics of the variables used in the study as well as the firm-year observations experience fluctuations in average loans and XAGT.

Table 1
Descriptive Statistics
Panel A: Average Loans (in millions)

Ccy.	Obs	Mean	Std. Dev	Median
IDR	385	57,011,550	116,237,718	7,580,957
MYR	88	112,144	113,646	79,960
PHP	143	207,723	293,983	81,777
SGD	55	111,145	97,282	120,199
THB	209	452,395	571,360	167,548

Panel B: Administrative and general expenses (in millions)

Ccy.	Obs	Mean	Std. Dev	Median
IDR	385	2,888,950	5,404,792	600,849
MYR	88	1,935	2,604.20	872.08
PHP	143	8,314	10,096	4,425
SGD	55	1,261	1,088	1,487
THB	209	11,365	12,989	5,628

Panel C: Periodic Fluctuations in Average LCUACU and XAGT (2008 to 2017)

Variable	Obs	%	Mean	Std. Dev	Median
aveLCUACU	800	16.33%	11.13%	13.82%	6.49%
XAGT	800	17.71%	15.77%	19.45%	8.07%

3.2 Discussion
3.2.1 Asymmetric cost behavior among banks in the ASEAN-5

The H1 results (Table 2) show that banks in the ASEAN-5 exhibit asymmetric cost behavior or cost stickiness. For every 1% increase in average loans to customers (LCUACU), there is a corresponding 0.290% increase in administrative and general costs (XAGT); but for every 1% decrease in average LCUACU, there is only a 0.173% (0.290-0.117) decline in XAGT. The increase in administrative and general costs for increases in average loans to customers is greater than the relative magnitude of a decrease in administrative and general expenses for decreases in average loans to customers. The results are consistent with Porporato and Werbin's (2012) study, which showed that banking industries are cost sticky in the short term because managers tend to delay cutting costs after considering the trade-off between the cost of retaining slack resources and adjustment costs of exit and subsequent replacement of resource. Since banks employ middle-skilled to high-skilled labor (Modestino, 2016), bank would retain the surplus labor in the short term as training new employees later would be more expensive.

In addition, relationship banking practices may also prevent managers from easily reducing slack labor resources. Instead of adjusting its slack resources when the average loans decrease, bank managers deliberately retain the labor force in the short term. Hence, the deliberate decision theory leads to the asymmetric cost behavior among banks in the ASEAN-5.

3.2.2 Effect of prior period changes in activity level to asymmetric cost behavior

As indicated in the H2 results of Table 2, there is no conclusive asymmetric cost behavior when prior period activity level increased since its β_2 is insignificant. However, conditional on prior period decreases in loans to customers, banks in ASEAN-5 exhibit asymmetric cost behavior. With 1% increase in average loans to customers, there is 0.222% increase in administrative and general expenses, but with 1% decrease in average loans, there is still 0.049% (0.222-0.271) increase in these expenses. Hence, banks in ASEAN-5 are cost sticky when prior period activity level decreased. The result proves that prior period changes in loans affect the degree of cost asymmetry in the current period.

Despite the prior period decrease in loans, cost stickiness among banks may be due to managers retaining greater slack resources since declines were deemed as temporary during normal periods (Banker, Fang & Mehta, 2013). Even with the Global Financial Crisis, the period under study (2007-2017) is largely considered as a normal period because the monetary and financial systems of Asia were "largely resilient" (Heng, 2009). The decisions to retain slack resources and spend more on advertisements lead to a net increase of 0.049% in administrative and general expenses even when loans to customers decreased in the prior period.

When loans in the prior period increased, there was a 0.358% increase in administrative and general expenses for every 1% increase in average loans in the current period. In contrast, when loans in the prior period decreased, there was a 0.222% increase in expenses for every 1% increase in average loans in the current period (see H2 results of Table 2). The findings are consistent with the prediction of Banker and Byzalov (2014) that increases in costs are greater after prior period increase in activity. It implies that these resource expansions are affected by managerial decisions, which are influenced by the manager's economic outlook.

3.3.3 Credit risk and asymmetric cost behavior

The H3 results in Table 2 show that credit risk significantly affects the degree of cost asymmetry in ASEAN-5 banks. For every 1% increase in average customer loans, there is 0.316% increase in administrative and general expenses, but for every 1% decrease in average loans, there is 0.199% (0.316-0.117) decline in XAGT. This implies that banks with high credit risk tend to be cost sticky.

Risk-taking firms are cost sticky because they tend to retain resources in response to activity decline (Salamah & Abulezz, 2017). Unlike risk/loss-averse managers who are more concerned with avoiding future losses for unfavorable demand realizations (Kitching et al., 2016), risk-taking firms would be more concerned with increasing profits than avoiding losses. As a result, they respond quicker to the increases in average loans and react slowly to the same decrease in average loans. Hence, banks with high credit risk tend to exhibit cost sticky behavior.

Table 2

Model Estimation Results

Coefficient/Variables	**H1** Cost asymmetry	**H2** Effect of prior period changes in activity level to cost asymmetry		**H3** Credit risk and cost asymmetry
		Prior period increase in loans	*Prior period decrease in loans*	
β_1	0.2896***	0.3577***	0.2218***	0.3164***
β_2	-0.1165**	0.0298	-0.2714***	-0.1171**
$\beta_1+\beta_2$	0.1731	0.3875	-0.0496	0.1993
Loan loss provision				-0.8461*
Interpretation	Asymmetric Cost Behavior, Sticky	No effect	Sticky	High credit risk significantly affects cost stickiness
N	800	800		730

β_1 represents the change in administrative and general expenses (XAGT) for every 1% increase in average customer loans, while $\beta_1+\beta_2$ represents the change in XAGT for every 1% decrease in average customer loans. β_2 captures the degree of asymmetry in XAGT in response to average loan decreases versus increases.

Significance are denoted as follows: * 90% Confidence Interval, ** 95% Confidence Interval, *** 99% Confidence Interval.

4. CONCLUSION

Research on cost sticky behavior has been pervasive, however financial institutions or banks were usually excluded from the tests due to their different business models and the high government intervention and regulations involved. Our study is the first study that examines the asymmetric cost behavior among banks in ASEAN-5 countries. We used average loans as proxy instead of sales as activity level indicators. Furthermore, our study has explored the recent anti-sticky phenomenon (Weiss, 2010), as compared to most studies that only focused on cost sticky behavior.

Results prove that commercial and universal banks in the ASEAN-5 are cost sticky. For every 1% increase in average loans to customers, there is a corresponding 0.290% increase in administrative and general costs; but for every 1% decrease in average loans, there is only 0.173% decline in these costs. Relationship banking and the high costs of training middle-skilled and high-skilled labor led to the retention of slack labor resources. In addition, since Islamic banks in the ASEAN-5 also exhibit cost sticky behavior, it contributes to the overall cost stickiness in ASEAN-5.

Conditional on prior period decrease in loans, ASEAN-5 banks exhibit sticky behavior in the current period. For every 1% increase in average total loans, claims and advances, there is 0.2218% increase in administrative and general costs, but for every 1% decrease, there is only 0.0496% increase in these costs. Interestingly, the decrease in average loans still led to an overall increase in administrative and general expenses. On top of retaining the slack resources, ASEAN-5 banks may have also incurred advertisement expenses to address the consecutive decline in loans.

Our study also found that high credit risk significantly affects the degree of cost asymmetry among banks in the ASEAN-5, leading to cost sticky behavior. This is attributed to the risk appetite of banks. Despite the decline in loans, risk-taking banks would still retain slack resources. They would respond quicker to increases in activity levels because they are more concerned with increasing profits than avoiding losses.

The findings of our study have important implications for bank managers in the ASEAN-5 especially in the aftermath of the ongoing pandemic. Cost stickiness is not necessarily bad; however, managers need to be aware of the tendency of banks to be cost sticky. They need to assess whether the sticky behavior present is due to their reasonable optimism on future activity level or whether it is due to inefficiency. When making decisions, managers need to consider the costs between retaining the slack resources and incurring adjustment costs such as retrenchment costs and subsequent training costs. Considering the ongoing ASEAN Integration and the uncertain conditions in the new normal, managers must be more prudent in making resource commitments, the corresponding adjustment costs, and its impact to the competitiveness of their company. Through the analysis provided by this study, bank managers would now have a more comprehensive understanding of cost behavior and consider that sticky costs can be determined and controlled.

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